PATENT
Attorney Docket No. 401188/Fukami

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

MISUMI et al.

Application No.:	09/848,256	Art Unit:	2811
Filed:	May 4, 2001	Examiner:	L. Thai
For:	SEALED SEMICON-DUCTOR DEVICE AND LEAD FRAME USED FOR THE SAME		

CLAIMS PENDING AFTER AMENDMENT IN RESPONSE TO THE OFFICIAL ACTION MAILED NOVEMBER 1, 2001

4. A sealed semiconductor device comprising:

a semiconductor chip; and

a lead frame including internal leads extending across part of and spaced from a surface of said semiconductor chip, wherein at least one of said internal leads includes a protrusion protruding toward and contacting the surface of said semiconductor chip.

5. The sealed semiconductor device according to claim 4, wherein said protrusion is an end of at least one of said internal leads that includes a bend proximate the end.

6. The sealed semiconductor device according to claim 4, wherein said protrusion includes a bent portion of one of said internal leads spaced from an end of said internal lead.

7. The sealed semiconductor device according to claim 4, wherein said internal leads include active internal leads electrically connected with wires to said semiconductor chip and said protrusion is part of a dummy internal lead not connected by a wire to said semiconductor chip.

8. The sealed semiconductor device according to claim 7, wherein

said semiconductor chip is substantially rectangular and has a pair of longer sides and a pair of shorter sides,

said active internal leads extend toward respective pads located proximate a central axis of said semiconductor chip across one of the longer pair of sides of said semiconductor chip, and

said dummy internal leads extend toward said semiconductor chip along and across one of the shorter pair of sides of said semiconductor chip.

9. The sealed semiconductor device according to claim 4, wherein said protrusion contacts a peripheral area of said semiconductor chip.

10. A sealed semiconductor device comprising:

a semiconductor chip;

a lead frame including internal leads extending across part of and spaced from a surface of said semiconductor chip; and

a die pad on which said semiconductor chip is mounted, wherein said lead frame includes protrusions extending substantially perpendicular to and contacting said die pad.

11. A sealed semiconductor device comprising:

a semiconductor chip;

a lead frame including internal leads extending across part of and spaced from a surface of said semiconductor chip, and

a die pad on which said semiconductor chip is mounted, said die pad including fixed protrusions extending toward and contacting some of said internal leads.

16. A lead frame for a sealed semiconductor device including a semiconductor chip having a substantially rectangular shape with a pair of longer sides and a pair of shorter sides and sealed in an encapsulating resin, the lead frame comprising:

internal leads extending toward and electrically connected with wires to respective pads located approximately along a central axis of the semiconductor chip; and

at least one dummy internal lead in direct contact with a surface of the semiconductor chip to ensure a fixed separation between the semiconductor chip and said internal leads, wherein

each internal lead extends across one of the longer sides of the semiconductor chip to the corresponding pad, and

each dummy lead extends across one of the longer sides of the semiconductor chip to reach a position opposite the semiconductor chip.

17. The sealed semiconductor device according to claim 10, wherein said protrusions are peripheral to and do not contact said semiconductor chip.

18. The lead frame according to claim 10, wherein said die pad is substantially rectangular and includes a pair of longer sides and a pair of shorter sides and said protrusions extend proximate the pair of longer sides of said die pad.

19. The lead frame according to claim 10, wherein said die pad is substantially rectangular and includes a pair of longer sides and a pair of shorter sides and said protrusions extend proximate the pair of shorter sides of said die pad.

20. A sealed semiconductor device comprising:

a semiconductor chip;

a die pad on which said semiconductor chip is mounted;

a lead frame including internal leads extending across part of and spaced from a surface of said semiconductor chip; and

a tape member having a first surface to which said internal leads are entirely bonded and fixed, and a second surface not fixed to but contacting said semiconductor chip, to ensure a fixed distance between said semiconductor chip and said internal leads.

21. A sealed semiconductor device comprising;

a semiconductor chip;

a lead frame including internal leads extending across part of and spaced from a surface of said semiconductor chip; and

a tape member located between said semiconductor chip and said internal leads to hold said semiconductor chip and said internal leads at a fixed distance from each other, said tape member having a first surface to which said internal leads are entirely bonded and fixed and a second surface, a part of the semiconductor chip contacting the surface of said semiconductor chip.

22. A lead frame and tape for a sealed semiconductor device having a semiconductor chip sealed within an encapsulating resin, the lead frame comprising:

internal leads extending toward and electrically connected with wires to respective pads located approximately along a central axis of the semiconductor chip; and

a tape member having a first surface to which said internal leads are fixed, said tape member being arranged at a position where a portion of a second surface of said tape member contacts a surface of the semiconductor chip when the semiconductor chip is sealed within the encapsulating resin.